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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/282,303	03/31/1999	JES BROENG	3701-4000	8406
7590 12/29/2003				
MORGAN & FINNEGAN LLP		EXAMINER		
345 PARK AVENUE		NATIVIDAD, PHILIP SANA		
NEW YORK, NY 10154				
		ART UNIT	PAPER NUMBER	
		2877		

DATE MAILED: 12/29/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/282,303

Applicant(s)

BROENG ET AL.

Examiner

Phil Natividad

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-- The MAILING DATE of this communication appears on the cover sheet with the corresponding address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 30 June 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-51, 53-92 and 97-135 is/are pending in the application.
- 4a) Of the above claim(s) 1-8, 11-17, 26-36, 41-45, 48-51, 53, 59-66, 71-78, 87-90, 101-106, 110-115, 122-123, 125-126, 129-130, 132-133 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 18-25, 46, 47, 67-70, 91, 92, 107-109, 124 and 131 is/are allowed.
- 6) ☒ Claim(s) 9, 10, 37-40, 54-58, 79-86, 97-100, 116-121, 127, 128, 134 and 135 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. §§ 119 and 120**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Election/Restrictions*

1. This application contains claims drawn to an invention nonelected WITHOUT traverse in Paper No. 14 and therefore withdrawn from examination. A complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action (37 CFR 1.144). See MPEP § 821.01.

### *Claim Rejections - 35 USC § 103*

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 9-10, 37-40, 54-58, 79-86, 97-100, 116-121, 127-128, 134-135 are rejected under 35 U.S.C. 103(a) as being unpatentable over DiGiovanni et al. ('236) in view of DiGiovanni et al. ('652). As to claim 54, DiGiovanni '236 discloses core region (11, 41, 51), and cladding region comprising periodic structure of primary elements (e.g. Fig. 1, 2, 4, 5) with refractive index lower than adjacent material (col. 5 lines 6-16), further disclosing a unit cell (col. 5 lines 16+). DiGiovanni '236 discloses the periodic structure (52, 53 of Fig. 5) further comprising secondary (outer) cladding region (53) with higher refractive index (col. 5 line 57-58, inner cladding lower effective refractive index than outer cladding), except without expressly disclosing specific higher-refractive-index secondary elements (instead, the outer cladding **entire region** is higher refractive index (with voids as the specific secondary elements)). However, DiGiovanni '652 discloses core region (71 of Fig. 8), inner cladding of lower refractive index

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(72 of Figs. 7, 8), and then an outer cladding of higher refractive index (84-85). DiGiovanni '652 teaches that a cladding region may be formed from fused elongated elements (Fig. 4, 3). (If not fully fused, as is shown in Fig. 4, the elongated/longitudinal element can be surrounded by air gaps 43, thus it is higher index than any material adjacent thereto). Therefore, it would have been obvious to combine the '236 teachings of a core, a periodic structure with inner (primary) cladding region of lower-, and then an outer (secondary) cladding region of higher-effective refractive index, with the teachings of '652 to have elongated elements (primary and secondary) forming said inner-lower and outer-higher refractive indexes, and it would have been obvious to one of ordinary skill in the art to apply these primary/secondary cladding teachings of '236 to the specific secondary elements of '652, for a motivation of choosing the desired effective refractive index ('236 col. 2 lines 13-49).

Further as to claims 9-10 and 56, the sum of areas of elements in exemplary hexagonal unit cell in Fig. 2 is 6 times the area of any one of them (or at least  $6 \times 1/3 =$  twice the area if unit cell defined center-to-center), which is larger than 1.2 or 1.3 times the area of any one of them). As to claims 37, 40 and 56-58, with a hexagonal polygon defined as the same as the hexagonal unit cell (vertex-to-vertex as center-to-center of the primary elements), the polygon will of course have area (meeting less than or) equal to the unit cell. As to claims 38-39, it would have been obvious to one of ordinary skill in the art to vary the specific ratio of sizes/areas of the longitudinal elements, for a motivation of optimizing the desired effective refractive index ('236 col. 2 lines 13-49).

4. As to claims 79-86 and 97-100, as applied above the prior art reads on applicant's claims, except for these further specifics of multiple cores/core regions. However, it would have been

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**notoriously** obvious to one of ordinary skill in the art at the time to modify the prior art to obtain applicant's claims, of which Official Notice is taken, e.g. for motivation of selecting single mode or multimode ('236 col. 3 line 27+ lines 26-36).

5. As to claims 116-121, 127-128, 134-135 as applied above the prior art reads on applicant's claims, except for these further specific utility applications of the invention. It would have been **notoriously** obvious to one of ordinary skill in the art to modify the prior art to obtain applicant's claims, of which Official Notice is taken, for the motivation of simpler, less costly method for making ('236 col. 2 line 3) PBG/PCF sensors, fiber amplifiers, or lasers.

***Response to Amendment/Arguments***

6. Applicant's arguments filed 6/30/03 have been fully considered but they are not persuasive. All of applicant's arguments stem from new 6/30/03 amendments (primarily to independent claims 9, 37, and 79) made such that all outstanding (rejected) claims now further comprise secondary elongated elements of larger refractive index, essentially incorporating the limitations of claim 54 into all outstanding claims. However, rejection of limitations of claim 54 was maintained and is now made final along with all rejections.

***Allowable Subject Matter***

7. Claims 18-25, 46-47, 67-70, 91-92, 107-109, 124, 131 are allowable.

8. The following is a statement of reasons for the indication of allowable subject matter: As to claim 18, the prior art of record, taken alone or in combination, fails to disclose or render obvious  $n_d \Lambda_2 > n_{ud} \Lambda_1 (\sqrt{3})$ , in combination with all the rest of the limitations of claim 18.

***Conclusion***

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner can be directed to Phil Natividad whose telephone number is 703-306-5944. The examiner can normally be reached on Tuesday through Friday and alternating Mondays; and supervising patent examiner Frank G. Font can be reached at 703-308-4881.

In view of delays in mail delivery in recent days, we at the USPTO would like to encourage you to communicate with the USPTO via facsimile. Facsimile transmissions may be used for correspondence as set forth in 37 CFR 1.6 such as: amendments, petitions for extension of time, authorization to charge a deposit account, an IDS, terminal disclaimers, a notice of appeal, an appeal brief, CPAs under 37 CFR 1.53(d), and RCEs.

PTO Form 2038 should be used when authorizing payment by credit card; this form is maintained separate from the file to ensure confidentiality.

The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306 for regular communications and (703) 872-9306 for After Final communications.

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Tech Center 2800 Customer Service is at 703-306-3329. Any inquiry of a general nature or relating to the status of this application or proceeding can also be directed to the receptionist whose telephone number is 703-308-0956.

*PCN*  
Phil Natividad  
Patent Examiner  
psn  
December 17, 2003

**FRANK G. FONT**  
**SUPERVISORY PATENT EXAMINER**  
**TECHNOLOGY CENTER 2800**

*For*  
*[Signature]*  
**Michael P. Stafira**  
**Primary Patent Examiner**  
**Technology Center 2800**